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INFORMATION REPORT INFORMATION REPORT

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50X1-HUM

COUNTRY Poland

REPORT

SUBJECT Tarnow District Gasworks in Poland ()

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location maps

with legends (Annexes C, C-1, C-2), of natural gas pipelines in the Tarnow District of Poland, as of 1959.

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REPORT

COUNTRY : Poland DATE DISTR. 35

SUBJECT : Tarnow District Gasworks in Poland NO. OF PAGES 27 Sept. 1960

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TARNOW DISTRICT GASWORKS IN POLAND (C)

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TARNOW DISTRICT GASWORKS IN POLAND (C)

Introduction

This report contains [] information on the Tarnow District Gasworks (Zaklady Gasownictwa Okregu Tarnowskiego-ZGOT) in Poland. All natural gas pipelines in the Tarnow District are shown on three overlays, Annexes C, C-1, and G-2, which were taken from map sheets with a scale of 1:100,000. [] The 50X1-HUM figures on the amount of gas transported by these pipelines were for the year 1958. The figure showing the amount of gas received from the natural gas occurrences, and the amount of gas used by consumers was the yearly average; an hourly average could not be determined because during the summer months consumers required less gas than during the winter months, and, therefore, much less gas was received from the gas occurrences during that period.

All natural gas occurrences are identified on the overlays by letters, whereas all other points of interest are identified by numerals. This system was used to aid the reader in distinguishing at a glance where the natural gas occurrences were located in the pipeline system.

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Listed below are the names and geographic and UTM coordinates of locations used throughout Poland.

<u>LOCATION</u>	<u>GEOGRAPHIC</u>	<u>UTM</u>
BIELSKO (BIALA)	49 49N 19 02E	CA 6020
BOCHNIA	49 58N 20 26E	DA 5936
BORYSLAW (BORISLAV), USSR	49 17N 23 25E	Not available
BRONOWICE	50 06N 19 53E	DA 2150
CHERZANOW	50 08N 19 24E	CA 8656
DABROWA-TARNOWSKA	50 11N 20 59E	DA 9958
DASZAWA (DASHAVA), USSR	49 15N 24 01E	Not available
DEBICA	50 03N 21 25E	EA 3045
DEBOWIEC	49 44N 18 43E	CA 3621
GLINIK	49 42N 21 32E	EA 3805
JAROSLAW	50 01N 22 40E	FA 2042
JASLO	49 45N 21 28E	EA 3410
KOSINA	50 03N 22 20E	EA 9647
KROSNO	49 42N 21 46E	EA 5505
LUBACZOW	50 09N 23 07E	FA 5259
MARKLOWICE	50 01N 18 32E	CA 2344

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TARNOW DISTRICT GASWORKS IN POLAND (C)

Introduction (Cont'd)

<u>LOCATION</u>	<u>GEOGRAPHIC</u>	<u>UTM</u>
MIELEC	50 17N 21 25E	EA 3071
OSTROWIEN	50 56N 21 23E	EB 2743
OSWIECIM	50 03N 19 15E	CA 7344
OZAROW	52 13N 20 49E	DC 8786
PILZNO	49 58N 21 18E	EA 2136
PIOTRKOW	51 24N 19 41E	CB 0997
PLOCK	52 32N 19 42E	DD 1122
PSZCZINA	49 58N 18 57E	CA 5338
PRZEMYSL	49 47N 22 47E	FA 2916
PRZEWORSK	50 04N 22 30E	FA 0746
ROZTOKI	49 44N 21 31E	EA 3911
RUDAWKA-RYMANOWSKA	49 31N 21 56E	EV 6886
RUDKA	50 57N 21 20E	EB 2344
SANOK	49 34N 22 12E	EV 8719
SIETESZ	49 59N 22 20E	EA 9738
STALOWA-WOLA	50 34N 22 04E	EB 7402
STARACHOWICE	51 03N 21 04E	EB 0456
STAROSIEDLICE	51 11N 21 13E	EB 1570
STRACHOCINA	49 37N 22 06E	EV 7896
TARNOBRZEG	50 35N 21 41E	EB 4703
TARNOW	50 00N 21 00E	DA 9940
TURASZOWKA	49 44N 21 43E	EA 5208
TURZA	50 15N 22 08E	EA 8168
TRZEBINIA	50 09N 19 27E	CA 9058
URSUS	52 12N 20 53E	DC 9283
ZABLOTCE	49 34N 22 10E	EV 8492
ZARUDZIE	49 58N 19 08E	CA 6638

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TARNOW DISTRICT GASWORKS IN POLAND (C)

Introduction (Cont'd)

LOCATION	GEOGRAPHIC	UTM
ZORY	50 03N 18 42E	CA 3546
ZURAWICA	49 49N 22 48E	FA 3020

1. Mission

The mission of the Tarnow District Gasworks was to receive natural gas from the Kroso, Sanok, and Ustrzyki Oil Drilling Enterprises (Krośnieńskie, Sanockie, and Ustrzyckie Kopalnictwa Naftowe), import natural gas from the USSR, and distribute by pipeline to consumers all the natural gas it received.

2. Main Office

a. Location

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The main office of the Tarnow District Gasworks was in TARNOW on the north-west corner of ulica Generala Dabrowskiego. Across the street was an open field. The telephone number of the gasworks was 526.

b. Description

The main office of the Tarnow District Gasworks was in a three-story, cream-colored, stuccoed building with white trimmings. 20' x 17' x 13' h. It housed all the branch offices of the Tarnow District Gasworks. (Sketch of the floor plan of the first two floors of the main office of the Tarnow District Gasworks see Annex A, Figures 1 and 2.)

c. Organisation

The administrative organization of the Tarnow District Gasworks is shown in Annex B. Duties of the respective individuals and offices were identical with those of counterpart offices

(C), except the following:

(1) Office of the Director

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The director of the Tarnow District Gasworks was Stanislaw SASIM.

(2) Office of the First Deputy Director Chief Engineer (I Zastepca Dyrektora Naczelnego-Inżynier)

The first deputy director of the Tarnow District Gasworks was Wladyslaw KOLODZIE.

(3) Production Branch (Dzial Produkcji)

This branch was responsible for keeping track of the quality and quantity of natural gas which the Tarnow District Gasworks received from the Kroso, Sanok, and Ustrzyki Oil Drilling Enterprises, and the quantity of natural gas that large consumers received from ZGOT. It also had to coordinate with the oil-drilling enterprises from which it received natural gas in estimating how much gas the gasworks would receive for 30 days, 3 months, and a year in advance.

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Whenever the director of an oil-drilling enterprise wanted, because of repairs or for some other reason, to reduce the amount of gas being sent to ZGOT, he had to notify the chief of the production branch in advance. If this reduction in gas presented a serious problem, the chief notified the director of ZGOT, who in turn notified the director of the Association of the Gas Industry (Zjednoczenie Przemyslu Gascowniczego-ZPG). A meeting was then called between representatives of the ZPG, ZGOT, the Central Administration of the Petroleum Industry (Centralny Zarzad Przemyslu Naftowego-CZPN) and the oil enterprise to try to resolve the situation.

(4) Office of the Second Deputy Director for Administrative Affairs (II Zastepca Dyrektora do Spraw Administracyjnych)

The second deputy director of the Tarnow District Gasworks was LIS, (fmu).

(5) Collections Branch (Dzial Inkasa)

Consumers paid ZGOT 50 slotys per cu m for the natural gas they used. ZGOT paid for the gas it received from the oil-drilling enterprises in the same manner that the larger consumers paid ZGOT for the gas they received. The cost of the gas was taken from the Tarnow District Gasworks' account and added to the account of the oil-drilling enterprise which supplied the gas.

3. Tarnow District Natural Gas Pipeline System

a. Background

In March 1959 there were five natural gas occurrences in operation, one that was not producing, and two that were supposed to go into operation in 1959.

Four of the producing natural gas occurrences were tied into the Tarnow natural gas pipeline system and provided it with about 27,500 cu m of natural gas per hour. The other producing natural gas occurrence provided local consumers around KROSNO with about 2000 cu m of natural gas per hour, and was not tied into the Tarnow natural gas pipeline system.

ZGOT received about 200,000,000 cu m of natural gas per year. Between 160 and 180 million cu m of the gas was transported by pipeline to consumers. The remaining 20 to 40 million cu m was transported to city and area gasworks, which, in turn, supplied their consumers.

Also about 14,400,000 cu m per year of natural gas was used in the KROSNO area, but this was counted separately because it was not part of the Tarnow pipeline system, even though ZGOT was responsible for the pipelines and was paid for the gas consumed. In general, all the gas equipment of the Tarnow District Gasworks was in good condition. Because of insufficient gas, all the high-pressure gas pipelines operated under lower working pressure than that for which they were designed.

The natural gas occurrences were operational an average of 330 days a year and were closed down or partly closed down 35 days a year for repairs, or some other reason.

ZGOT also received between 160 and 180 million cu m of natural gas a year from the USSR, and planned to import twice that amount from the USSR when construction work on the Przemysl Compressor Station was completed. This station, in ZURAWICA close to the Polish-Soviet border, was to go into operation in 1959.

b. Natural Gas Occurrences

Although the Tarnow District Gasworks was responsible for the distribution of natural gas, it was not responsible for drilling the shafts to the natural gas

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occurrences. This was the responsibility of the Krosno, Sanok, and Ustrzyki Oil-Drilling Enterprises. They drilled the shafts to the natural gas occurrences; built measuring stations (or reduction and measuring stations when needed) at the sites; and sold the natural gas to ZGOT. According to state law, no more than 8 percent of the estimated total capacity of a natural gas occurrence could be removed per year, but this law was not strictly adhered to because ZGOT was granted special permission by the Higher Mining Office (Wyzszy Urzad Gorniczy w Krakowie), at ulica Lubics 14 in KRAKOW, to receive more than the allowable 8 percent from the Debowiec, Zablotec, and Strachocina natural gas occurrences. The special permission was granted because during the winter months there was a serious shortage of natural gas in Poland, and this was the only way to ease the situation. The Higher Mining Office was subordinate to the Ministry of Mining and Power (Ministerstwo Gornictwa i Energetyki-MGE).

(1) Marklowice Natural Gas Occurrence (See Annex C, Item A)

There were actually two parts to this natural gas occurrence. Both were about 80 m from either side of the MARKLOWICE-JANKOWICE-RYBNIK highway in MARKLOWICE at coordinates 50 01N 18 32E, UTM CA 245447; and 50 00N 18 32E, UTM CA 246426.

This natural gas occurrence went into operation in 1952, but the gas from it was used locally, and it was not connected to the Tarnow pipeline system until 1954. The pressure from the occurrence was very weak (about 3 atmospheres), and a compressor station had to be first built at the site. This compressor station was completed in 1954 and was connected to the Tarnow pipeline system the same year.

The capacity of the occurrence was estimated as about 200 million cu m of natural gas, and ZGOT received about 2500 cu m of natural gas per hour from it. The quality of the gas was 8000 k/cal per cu m, and it was almost pure methane.

This natural gas occurrence was considered an emergency supply, and was used during the winter months when there was a greater demand for gas, and closed down during the summer months. The reason for this was that it required a great deal of repair and its capacity was not considered great.

(2) Debowiec Natural Gas Occurrence (See Annex C, Item B)

The Debowiec natural gas occurrence was in DEBOWIEC. There were also two parts to this occurrence. The coordinates for each part were 49 48N 18 43E, UTM CA 351205; and 49 48N 18 46E, UTM CA 380199.

This natural gas occurrence was connected to the Tarnow pipeline system in 1948, and its capacity was estimated to be between 150 and 200 million cu m of natural gas. The quality of the gas was 8600 k/cal per cu m, and it was almost pure methane. The pressure of the gas from the occurrence was 15 to 18 atmospheres, which was reduced to 12 atmospheres by two reduction and measuring stations, one at each part of the natural gas occurrence. ZGOT received about 3000 cu m of natural gas per hour from this gas occurrence, and the exact amount of natural gas it received was measured at the reduction and measuring stations.

(3) Dabrowa-Tarnowska Natural Gas Occurrence (See Annex C, Item C)

This natural gas occurrence was in DABROWA-TARNOWSKA at coordinates 50 10N 19 58E, UTM DA 970578. It was supposed to start providing ZGOT with 6000 cu m of natural gas per hour in 1959, and [] been doing so since about June 1959. The capacity of the occurrence was estimated to be between 200 and 300 million cu m of natural gas. The quality of the gas was 8600 k/cal per cu m, and it was almost pure methane. There was no reduction station at the gas

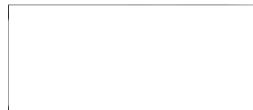
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occurrence. The pressure of the gas from the occurrence was 40 atmospheres and the only pipeline available to transport the gas was designed to operate under 40 atmospheres of working pressure, thereby eliminating the need for a reduction station.

(4) Zablotce Natural Gas Occurrence (See Annex C, Item D)

The Zablotce Natural Gas Occurrence, in ZABLOTCE at coordinates 49 34N 22 10E, UTM EV 842923, went into operation in 1955. ZGOT received about 9000 cu m of natural gas from this occurrence. The capacity of the occurrence was estimated to be about 500 million cu m of natural gas, and there were three shafts drilled to it. The quality of the gas was 5700 k/cal per cu m, and it contained 22 percent nitrogen and 78 percent methane. The pressure of the gas from the occurrence was 80 atmospheres, but at the reduction and measuring station this was reduced to 45 atmospheres before it went into the trunk line.

There was also a purifying station at this natural gas occurrence. It was needed because the gas contained much water and dust that had to be removed.

(5) Strachocina Natural Gas Occurrence (See Annex C, Item E)

This natural gas occurrence, in STRACHOCINA at coordinates 49 37N 22 05E, UTM EV 780979, went into operation before World War II.

ZGOT received about 13,000 cu m of natural gas per hour from the Strachocina natural gas occurrence. The quality of the gas was 8650 k/cal per cu m, and it contained gasoline, propane and butane (10-15 gr per m³ combined). The capacity of the gas occurrence was estimated to be about one billion cu m of natural gas and there were three shafts drilled to it. The pressure of the gas from the occurrence was 96 atmospheres, but this was reduced at the reduction and measuring station to 40 atmospheres before it entered the trunk line.

The Strachocina Gasoline Plant (Gazoljniarnia Strachocina), at the natural gas occurrence, removed 75 percent of the butane, propane, and gasoline from the gas coming from the Strachocina natural gas occurrence, using the expansion method, by which about 130 liters of butane, propane, and gasoline per hour were obtained, and only about 195 cu m of natural gas per hour was lost in the process.

(6) Rudawka-Rymanowska Natural Gas Occurrence (See Annex C, Item F)

This natural gas occurrence was in RUDAWKA-RYMANOWSKA at coordinates 49 37N 49 57E, UTM EV 681862.

In 1959 this natural gas occurrence was not in operation because the flow of gas from it stopped suddenly. More shafts were to be drilled in this area in an attempt to locate more gas

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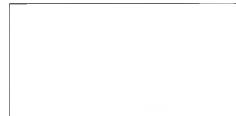
(7) Lubaczow Natural Gas Occurrence (See Annex C, Item G)

This natural gas occurrence, in LUBACZOW at coordinates 50 09N 23 09E, UTM FA 528582, was supposed to go into operation in 1959.

ZGOT was supposed to start receiving 30,000 cu m of natural gas per hour from it in 1959, and it was doing so in July 1959. The quality of this gas was 8550 k/cal per cu m and it was almost pure methane, with a small amount of hydrogen sulfide in it. The pressure of the gas from the occurrence was 100 atmospheres, but this was reduced at the reduction and measuring station to 45 atmospheres. The capacity of the gas occurrence was estimated to be between 2 and 3.5 billion cu m of natural gas.

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Just before March 1959 plans were being made to build a purifying station at the natural gas occurrence for the purpose of removing the hydrogen sulfide from the gas. It was scheduled to be finished by the time the natural gas occurrence was ready to go into operation.

(8) Krosno Oil Field (See Annex C, Item H)

The Krosno Oil Field was in KROSNO and TURASZOWKA at coordinates 49 42N 21 47E, UTM EA 551060; and 49 43N 21 43E, UTM EA 525080.

In addition to producing oil, this field also produced natural gas. The gas did not go into the Tarnow pipeline system, but was used by KROSNO and other surrounding communities. About 2000 cu m of natural gas per hour was received from this field. The quality of the gas was 8600 k/cal per cu m, and it was almost pure methane.

The pressure of the gas from the occurrence was only .006 atmospheres, and a compressor station would probably have to be constructed there very soon.

(9) Imported Natural Gas

Poland received about 22,000 cu m of natural gas per hour from the Boryslaw and Daszawa Natural Gas Occurrences located in BORYSLAW and DASZAWA, USSR. The quality of this gas was 8550 k/cal per cu m, and it was almost pure methane. None of the chemicals were removed from the gas before it was transported to Poland; this was so because the above-mentioned occurrences had belonged to Poland before the Polish-Soviet boundary was changed in 1945.

Before the discovery of natural gas in LUBACZOW, a plan was approved to increase the import of natural gas from the USSR to 44,000 cu m per hour. To accomplish this, a compressor station had to be built near the Polish-Soviet border. This station, the Przemysl Compressor Station, was under construction in ZURAWICA in March 1959, and was to be completed in 1959. 50X1-HUM because of the discovery of natural gas in LUBACZOW, there would be no need to import that much more additional gas from the USSR and that some change in the planned increase of imported natural gas would undoubtedly be made or had been made since March 1959.

c. Compressor Stations (See Annex D)

In March 1959 there was only one compressor station in operation in the Tarnow District; it was in MARKLOWICE. Another station was being built in ZURAWICA (see paragraph 3b(9) above).

(1) Marklowice Compressor Station (See Annex C, Item 39; and Annex D)

The Marklowice Compressor Station was subordinate to the Krakow Field Maintenance Branch and was in MARKLOWICE, about 10 m north of the MARKLOWICE-JANKOWICE-RYBNIK Highway. The purpose of this station was to compress the gas received from the Marklowice natural gas occurrence, which did not have enough natural pressure of its own.

This station contained two high-pressure, piston-type MAW compressors. Each was designed to operate under 9 atmospheres of working pressure but actually operated under about 6 atmospheres, and was powered by a Polish, 6000-V, 320-KW, M-5 electric motor. The capacity of each compressor was 2500 cu m of natural gas an hour. Both were built by the Gazobudowa State Enterprise for Construction of Gas Equipment ("Gazobudowa," Panstwowe Przedsiębiorstwo Budownictwa Urzadzeń Gazowniczych-PPBUG) in 1954 and were in good condition,

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(2) Przemysl Compressor Station (See Annex C, Item 2; also Annex D)

The Przemysl Compressor Station was subordinate to the Sandomierz Field Maintenance Branch and was on the highway to RYBNIK in ZURAWICA. Its purpose was to increase the import of natural gas from the USSR.

This compressor station contained three East German piston-type, high-pressure KS compressors. Each compressor was designed to operate under 25 atmospheres of working pressure, was powered by a Polish 6000-V, 400-KW, M-5 electric motor, and had a capacity of 10,000 cu m of natural gas per hour.

d. Natural Gas Pipelines of the Tarnow District

All natural gas pipelines of the Tarnow District had several things in common: they were all made of steel, the preservative on them was asphalt and kraft paper, they all transported natural gas, and they had a life expectancy of 20 years. The diameter given for each is the internal diameter.

(1) Trunk Line From the Polish-Soviet Border to the Mory Reduction and Measuring Station (See Annex C; C-1; and C-2, Item 15)

This trunk line began at the Polish-Soviet border, where Poland received 22,000 cu m of natural gas per hour from the USSR, and ended at the Mory Reduction and Measuring Station.

This trunk line was not laid all at one time, and information on it between designated points varied. The first part of the trunk line, from the Polish-Soviet border as far as the branch line going to Item 6, was 159 km long, and was laid between 1934 and 1936 by a Polish enterprise (nu). [redacted] the internal diameter of this part of the trunk line was 400 mm.

[redacted] The thickness of the pipe, if it was 400 mm in diameter, was 9 mm, and 7 mm if it was 300 mm in diameter. This portion of the trunkline was designed to operate under 25 atmospheres of working pressure, but actually operated under about 20 atmospheres in summer, and about 8 atmospheres in winter. The sections of pipe in this part of the trunk line had butt-welded butt joints. [redacted] this portion of the trunk line [redacted] in good condition.

The next portion of the trunk line was between the branch line going to Item 6 as far as Item 7. This portion was 26 km long, 300 mm in diameter, 7.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under 20 atmospheres in summer and 8 atmospheres in winter, and had butt-welded butt joints. It was laid between 1934 and 1936 and was in good condition.

The following portion of the trunk line was from Item 7 to Item 10. This portion was 59 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 16 atmospheres, and had butt-welded butt joints. It was laid in 1936 and was in good condition.

The next portion of the trunk line was from Item 10 to the city of STAROSIEDLICE. This portion was 17 km long, 350 mm in diameter, 8 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1950 by Gazobudowa and was in good condition.

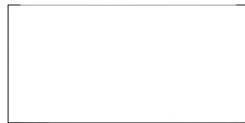
The next portion of the trunk line, from STAROSIEDLICE to Item 13, was 134 km long, 300 mm in diameter, 7.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and

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had butt-welded butt joints. There were two pipelines 1 m below the river bed where the trunk line crossed the Pilica River. Two were laid so that, if something happened to one, the other could be used. All the trunk line was laid in 1950 by Gazobudowa and was in good condition.

The last portion of the trunk line was from Item 13 to Item 15. It was 5 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1951 by Gazobudowa and was in good condition.

The exact amount of gas ZGOT received from the USSR was measured at a measuring station in PRZEMYSŁ (see Annex C, Item 1).

(a) Branch Line to Item 3 (See Annex C, Item 3)

This branch line transported natural gas to the Jaroslaw Reduction and Measuring Station. It was 1.5 km long, 100 mm in diameter, 4 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres in summer and about 8 atmospheres in winter, and had butt-welded butt joints. It was laid in 1935 and was in good condition.

The Jaroslaw Reduction and Measuring Station measured the amount of gas going to JAROSŁAW and reduced the pressure of the gas before it went into the low-pressure gas pipelines of the city.

JAROSŁAW received from ZGOT about 500 cu m of natural gas per hour, which was used in homes and small industries in that city.

(b) Branch Line to Item 4 (See Annex C, Item 4)

This branch line transported natural gas to the Przeworsk Reduction and Measuring Station. It was 1 km long, 100 mm in diameter, 4 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres in summer and about 8 atmospheres in winter, and had butt-welded butt joints. It was laid in 1936 and was in good condition.

The Przeworsk Reduction and Measuring Station measured the amount of gas PRZEWORSK received and reduced the pressure of the gas before it went into the low-pressure gas pipelines of the city.

PRZEWORSK received from ZGOT about 800 cu m of natural gas per hour, which was used in homes and small industries in that city.

(c) Branch Line from Junction near Item 5 to Junction near Item 24
(See Annex C, Item 5 and Item 24)

There were no consumers along this branch line. Its sole purpose was to transport natural gas in a westerly direction from the pipeline junction near Item 5 to where it joined another branch line near Item 24. This increased the amount of gas the latter could transport north to consumers located along it. The branch line (from junction near Item 5 to junction near Item 24) was 41 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres in summer and about 8 atmospheres in winter, and had butt-welded butt joints. It was laid in 1940 and was in good condition.

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(d) Branch Line to Item 5 (See Annex C, Item 5)

This branch line transported natural gas to the Rzeszow Reduction and Measuring Station. It was 500 m long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres in summer and about 8 atmospheres in winter, and had butt-welded butt joints. It was laid in 1937 and was in good condition.

The Rzeszow Reduction and Measuring Station received from ZGOT about 1500 cu m of natural gas per hour, which was used in homes and small industries in RZESZOW.

(e) Branch Line to Item 6 (See Annex C-1, Item 6)

This branch line transported natural gas to the Stalowa Wola Steel Works. It was 500 m long, 300 mm in diameter, 7.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres in summer and 8 atmospheres in winter, and had butt-welded butt joints. It was laid in 1935 and was in good condition.

The Stalowa Wola Steel Works, which was in STALOWA WOLA, produced steel doors for Martin open-hearth furnaces and T, I, U, L and channel beams for bridges and industrial buildings. It received about 7000 cu m of natural gas per hour from ZGOT.

(f) Sandomierz Reduction, Measuring and Distributing Station (See Annex C-1, Item 7)

Item 7 was the Sandomierz Reduction, Measuring and Distributing Station. It received natural gas from a trunk line coming from the southeast (from Item 1 to 7) and a branch line coming from the southwest. About 400 cu m of this gas per hour went to the city of SANDOMIERZ, where it was used in homes, and the rest was transported north by the trunk line leading to the Warsaw Area Gasworks.

(g) Branch Line to Item 8 (See Annex C-1, Item 8)

This branch line transported natural gas to the Ostrowiec Steel Works. It was 1 km long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres in summer and about 8 atmospheres in winter, and had butt-welded butt joints. It was laid in 1957 and was in good condition.

the Ostrowiec Steel Works was 50X1-HUM
in OSTROWIEC, produced pig iron and steel, T, I, U, L and channel beams for bridges and construction work, and received about 1500 cu m of natural gas per hour from ZGOT.

(h) Branch Line to Item 9 (See Annex C-2, Item 9)

This branch line transported natural gas to the Kielce Steam Boiler Parts Factory (Kielcza Fabryka Armaturow). It was 52 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1955 by Gasebudewa and was in good condition.

The Kielce Steam Boiler Parts Factory in KIELCE produced parts for steam boilers. It received about 400 cu m of natural gas per hour from ZGOT.

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(i) Lubienia Measuring Station (See Annex C-2, Item 10)

This measuring station was on the trunk line and its purpose was to measure the amount of gas reaching this point. It was also used to determine whether any gas was being lost along the trunk line.

(j) Branch Line to Item 11 (See Annex C-2, Item 11)

This branch line transported natural gas to the Starachowice Truck Factory (Starachowicka Fabryka Samochodow). It was 8 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1938 and was in good condition.

The Starachowice Truck Factory in STARACHOWICE was engaged in the production of 4-ton Star-20 trucks (about 15,000 a year). It received about 1000 cu m of natural gas per hour from ZGOT.

(k) Branch Line to Item 12 (See Annex C-2, Item 12)

This branch line transported natural gas to the Radom City Gasworks (Gasownia Radom). It was 1 km long, 150 mm in diameter, 4 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1950 by Gasobudowa and was in good condition.

The Radom City Gasworks in RADOM was subordinate to the City National Council (Miejska Rada Narodowa). It received about 1200 cu m of natural gas from ZGOT and distributed it to consumers in RADOM.

(l) The Warsaw Area Gasworks (Zaklady Gazownictwa Okregu Warszawskiego)
(See Annex C-2, Item 13)

The Warsaw Area Gasworks, on ulica Kasprzaka in WARSAW, was directly subordinate to the Association of the Gas Industry.

This gasworks produced about 8000 cu m of coal gas and about 4500 cu m of generator gas per hour. Since this was not enough to meet the requirements of its consumers, it received an additional 3000 cu m of natural gas per hour from ZGOT. About 500 cu m of the natural gas it received per hour was mixed with all the coal and generator gas, making a total of 13,000 cu m of gas per hour, and transported by pipeline to WARSAW and the surrounding area, where it was used in homes and industries. The remaining 2500 cu m of natural gas per hour was allowed to continue along the trunk line to other consumers who were supplied gas by the Warsaw Area Gasworks. All consumers and pipelines beyond Item 13 were the responsibility of the Warsaw Area Gasworks and not the Tarnow District Gasworks.

(m) Branch Line to Item 14 (See Annex C-2, Item 14)

This branch line transported natural gas to the Ursus Tractor Factory (Fabryka Traktorow Ursus). It was 1200 m long, 200 mm in diameter, 6 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1952 by Gasobudowa and was in good condition.

The factory at URSUS, which received about 800 cu m of natural gas per hour from the Warsaw Area Gasworks, produced Ursus tractors.

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(n) Mory Reduction and Measuring Station (See Annex C-2, Item 15)

The only purpose of the Mory Reduction and Measuring Station was to distribute natural gas to two consumers (the Warsaw Steel Works and the Ozarow Glass and Picture Tube Factory); but when the planned trunk line section from PIOTRKOW to WARSAW was completed in 1961, the valve on the trunk line coming from the Warsaw Area Gasworks was to be closed and this station was to receive purified coal gas from the Zabrze District Gasworks, reduce its pressure, measure it, and send it, instead of natural gas, to the Warsaw Steel Works and the Ozarow Glass and Picture Tube Factory. The Warsaw Area Gasworks was to pay the Zabrze District Gasworks for this gas, and it in turn was to bill the Warsaw Steel Works and the Ozarow Glass and Picture Tube Factory. This station will also be able to send the Zabrze District Gasworks natural gas in case of emergency, by merely reopening the valve on the trunk line coming from the Warsaw Area Gasworks.

(o) Branch Line to Item 16 (See Annex C-2, Item 16)

This branch line transported natural gas to the Warsaw Steel Works. It was 10 km long, 400 mm in diameter, 8 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under 5 to 10 atmospheres, and had butt-welded butt joints. It was laid in 1955 by Gazobudowa and was in good condition.

The Warsaw Steel Works was in WARSAW

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it was still under construction and it would produce steel for tractors, trucks, and automobiles. It received about 1500 cu m of natural gas per hour from the Warsaw Area Gasworks.

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(p) Branch Line to Item 17 (See Annex C-2, Item 17)

This branch line transported natural gas to the Ozarow Glass and Picture Tube Factory (Fabryka Szkla i Kineskopowych Ozarow). It was 6 km long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under 5 to 10 atmospheres, and had butt-welded butt joints. It was laid in 1957 by Gazobudowa and was in good condition.

The Ozarow Glass and Picture Tube Factory, on the WARSAW-LODZ Highway in OZAROW, received about 250 cu m of natural gas per hour from ZGOT. This factory produced glass envelopes for picture tubes, which were sent to the Martin Kasprzak Radio Factory T-3 (Zaklady Radiowe im. Kasprzaka Martina T-3), on ulica Kasprzaka in WARSAW, which produced television sets and all types of radios, for both civilian and military use.

(2) Trunk Line from Item D to Item E (See Annex C, Items D and E)

This trunk line transported natural gas from the Zablotce natural gas occurrence to the Strachocina natural gas occurrence, where additional gas was received and transported in a westerly direction (as shown on Annex C). This trunk line was 8.5 km long, 300 mm in diameter, 7.5 mm thick, was designed to operate under 40 atmospheres of working pressure, actually operated under 40 atmospheres of pressure, and had butt-welded butt joints. It was laid in 1952 by Gazobudowa and was in good condition. There was one branch line from the end of this trunk line.

(a) Branch Line to Item 18 (See Annex C, Item 18)

This branch line transported natural gas to the Sanok Reduction and Measuring Station. It was 3 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 12 atmospheres of working pressure, actually worked under 12 atmospheres, and had butt-welded butt joints. It was laid in 1925 but was still in good condition.

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The Sanok Reduction and Measuring Station received about 1500 cu m of natural gas per hour from ZGOT and distributed it to the city of SANOK. The largest consumer of natural gas in SANOK was the San Railroad Car and Bus Factory (Fabryka Wagonow i Autobusow San), which received about 1000 cu m of natural gas per hour. The remaining 500 cu m of natural gas per hour was used in homes in SANOK.

the San Railroad Car and Bus
Factory was in SANOK and produced railroad cars and buses. 50X1-HUM

(3) Old Trunk Line from Item E to Item 19 (See Annex C, Items E and 19)

There were two trunk lines from the Strachocina natural gas occurrence to the Krosno Reduction and Measuring Station. The old trunk line was north of the new one, and there were no branch lines from it. This trunk line was very old and was seldom used. It was 26 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 30 atmospheres of working pressure, and had butt-welded butt joints. It was laid during World War I and was in poor condition.

(4) New Trunk Line from Item E to Item 19 (See Annex C, Items E and 19)

This trunk line was south of the old trunk line and ran from the Strachocina natural gas occurrence to the Krosno Reduction and Measuring Station. It was 26 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 40 atmospheres of working pressure and actually did; and it had butt-welded butt joints. It was laid in 1953 by Gazobudowa and was in good condition.

(5) Trunk Line from Item F to New Trunk Line Between Items E and 19 (See Annex C, Items E, F, and 19)

This trunk line was supposed to transport natural gas from the Rudawka-Rymanowska natural gas occurrence to the new trunk line between Items E and 19; but the flow of natural gas from this occurrence had ceased and in March 1959 it was not in operation. The trunk line was 17 km long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 40 atmospheres of working pressure, and had butt-welded butt joints. It was laid in 1953 by Gazobudowa and was in good condition.

The Krosno Reduction and Measuring Station (see Annex C, Item 19) measured the amount of gas reaching the station and reduced its pressure to 25 atmospheres. But this station did not receive all the natural gas from the Strachocina natural gas occurrence. There was another trunk line that joined the new trunk line between Items E and 19. The junction of these two trunk lines was just before the Krosno Reduction and Measuring Station.

(6) Trunk Line from the Trunk Line Between Items E and 19, to Item 20 (See Annex C, Items E, 19, and 20)

This trunk line transported natural gas to the Warzyce Distributing Station. The reason the gas did not come from the Krosno Reduction and Measuring Station was that ZGOT wanted this trunk line to operate under 40 atmospheres of pressure and the Krosno Reduction and Measuring Station was designed to reduce the pressure of the gas it received to 25 atmospheres. This trunk line was 19 km long, 300 mm in diameter, 7.5 mm thick, was designed to operate under 40 atmospheres of working pressure and actually did, and had butt-welded butt joints. It was laid in 1957 by Gazobudowa and was in good condition.

(7) Trunkline from Item 19 to Item 20 (See Annex C, Items 19 and 20)

This trunk line transported natural gas from the Krosno Reduction and Measuring Station to the Warzyce Distributing Station. It was 25 km long, 250 mm

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in diameter, 6 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1925, but was still in good condition. There were two short branch lines from it.

(a) Branch Line to Item 21 (See Annex C, Item 21)

This was a very short branch line to the Glinik Gasoline Plant (Gasolniarnia Glinik) at GLINIK. It received 8000 to 10,000 cu m of natural gas per hour from ZGOT.

From the natural gas it received, this plant extracted propane, butane, and liquid gasoline by the absorption method, using activated carbon. The yield was about 1 liter of propane and butane and 1 liter of liquid gasoline per 100 cu m of natural gas. The extraction consumed about 100 m³ h of the natural gas; the remainder went back into the trunk line and was transported to Items 22 and 20 (Annex C). The plant labor force numbered about 50, including about 10 armed civilian guards in special uniforms.²

(b) Branch Line to Item 22 (See Annex C, Item 22)

This was a very short branch line to the Jaslo Reduction and Measuring Station. The station received from ZGOT about 1500 cu m of natural gas per hour, which was used in homes and small industries in JASLO.

(c) Warzyce Distributing Station (See Annex C, Item 20)

The Warzyce Distributing Station received, from the Krosno Reduction and Measuring Station, natural gas, which was transported through the two previously mentioned trunk lines. It also received natural gas from the Roztoki Natural Underground Reservoir (Annex C, Item 23), but only in the winter.

(d) Branch Line to Item 23 Underground Reservoir (See Annex C, Item 23)

This branch line transported natural gas to and from the Roztoki Natural Underground Reservoir. It was 2 km long, 250 mm in diameter, and 6.5 mm thick; was designed to operate under 40 atmospheres of working pressure, actually operated under about 30 atmospheres; and had butt-welded butt joints. It was laid in 1956 by ZGOT and was in good condition.

The Roztoki Natural Underground Reservoir was a large underground cavity. About 15 million cu m of natural gas a year, which was estimated to be only a very small fraction of its capacity, was stored in it. Any extra gas not needed during the summer was stored in it until winter, when there was a much greater demand.

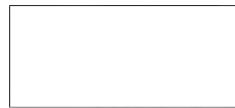
(8) Trunk Line from Item 20 to Item 36 (See Annex C, Items 20 and 36)

This trunk line ran in a westerly direction from the Warzyce Distributing Station to the Jawiszowice Natural Gas Distribution Junction. The first 6 km of the line were new, laid in 1957 by Gazobudowa, and were in good condition. The line was designed to operate under 40 atmospheres of working pressure.

The next 139 km, from the end of the first 6-km section to the branch line going to Item 30, was old. It was laid in 1923, was designed to operate under 25 atmospheres of working pressure, and always needed repairs due to its poor condition.

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The last portion, from the branch line to Item 30, to Item 36, was 62 km long. It was laid in 1948 by Gazobudowa, was designed to operate under 25 atmospheres of working pressure, and was in good condition. The entire trunk line was about 207 km long, 250 mm in diameter, 6.5 mm thick, had butt-welded butt joints, and actually operated under about 25 atmospheres.

(a) Branch Line to Item 7 (See Annex C and Annex C-1)

This was the first branch line from the trunk line. It extended from its junction with the trunk line as far as the Sandomiers Reduction, Measuring and Distributing Station. It also received additional gas from a previously-mentioned branch line (see paragraph 3d(1)(c)) that joined it near Item 24. The branch line (to Item 7) was 95 km long, 250 mm in diameter 6.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1920 and was in fair condition. Any surplus gas not used by consumers along this branch line went to the Sandomiers Reduction, Measuring and Distributing Station, where part of it was transported to SANDOMIERZ and the rest was transported by trunk line toward Item 13.

1. Pipeline to Item 24 (See Annex C, Item 24)

This pipeline transported natural gas to the Debica Rubber Products Factory (Debica Fabryka Wyrobów Gumowych). It was 200 m long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1933 and was in good condition.

The Debica Rubber Products Factory in DEBICA manufactured rubber tires and other rubber parts (type unknown). It received about 1200 cu m of natural gas per hour from ZGOT.

2. Pipeline to Item 25 (See Annex C-1, and Annex C, Item 25)

This pipeline transported natural gas south to the Tarnow Chemical Factory (Zaklady Chemiczne Tarnow). It was 44 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1938 and was in good condition.

The Tarnow Chemical Factory, about 3 km north of TARNOW, received a total of about 9000 cu m of natural gas per hour from ZGOT. Part of the gas was transported by this branch line and part by another branch line coming into the factory from the south. The factory used the gas it received in the production of synthetic ammonia (NH_3), which was reprocessed into fertilizer.

The factory also produced methanol.

The factory was built before World War II, and the labor force was about 6000 workers.

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2. Pipeline to Item 26 (See Annex C-1, Item 26)

This pipeline transported natural gas to the Mielec Airplane Factories (Fabryki Przemyslu Lotniczego). It was 1.5 km long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1930 but was in good condition.

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The Mielec Airplane Factories were in MIELEC. [redacted] these factories 50X1-HUM received about 1000 cu m of natural gas per hour from ZGOT and [redacted] they produced MIG-15 fighter planes.

4. Pipeline to Item 27 (See Annex C-1, Item 27)

This pipeline transported natural gas to the Tarnobrzeg Sulfur Mine and Workers' Settlement (Tarnobrzeg Kopalnia Siarki i Osiedle Robotnicze). It was 500 m long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1958 by Gazobudowa and was in good condition.

[redacted] the settlement was 500 m southwest of TARNOBRZEG and received about 500 cu m of natural gas per hour from ZGOT.

(b) Branch Line to Item 25 (See Annex C, Item 25)

This branch line also transported natural gas to the Tarnow Chemical Factory. It was 7.5 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1930 and was in good condition.

(c) Branch Line to Item 28 (See Annex C, Item 28)

This branch line transported natural gas to the Tarnow Reduction and Measuring Station. It was 500 m long, 200 mm in diameter, 6 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints.

The Tarnow Reduction and Measuring Station received about 2000 cu m of natural gas per hour from ZGOT. All this gas went to TARNOW, where it was used in homes and small industries.

(d) Branch Line to Item 29 (See Annex C, Item 29)

This branch line transported natural gas to the Bochnia Reduction and Measuring Station. It was 500 m long, 80 mm in diameter, 3.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 20 atmospheres, and had butt-welded butt joints. It was laid in 1958 by Gazobudowa and was in good condition.

The Bochnia Reduction and Measuring Station received from ZGOT about 400 cu m of natural gas per hour, all of which was sent to BOCHNIA, where it was used in homes.

(e) Branch Line to Item 30 (See Annex C, Item 30)

This branch line transported natural gas to the Lenin Steel Works. It was 13 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1952 by Gazobudowa and was in good condition.

The Lenin Steel Works³ received about 1200 cu m of natural gas per hour from ZGOT.

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1. Pipeline to Item 31 (See Annex C, Item 31)

This pipeline transported natural gas to the Krakow Area Gasworks. It was 150 m long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under 10 atmospheres, and had butt-welded butt joints. It was laid in 1925 but was in fair condition.

The Krakow Area Gasworks was subordinate to the Association of the Gas Industry. It received about 500 cu m of natural gas per hour from ZGOT and distributed it to homes and small industries in KRAKOW.

(f) Branch Line to Item 32 (See Annex C, Item 32)

This branch line transported natural gas to the Krakow Bronowice Reduction and Measuring Station, which was subordinate to the Krakow Area Gasworks. The line was 500 m long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1957 by Gazobudowa and was in good condition. There was also a 30,000 cu m gas holder at this station, built in 1957 by Gazobudowa. The station received about 500 cu m of natural gas per hour from ZGOT and sent it to BRONOWICE and KRAKOW, where it was used in homes.

(g) Branch Line to Item 33 (See Annex C, Item 33)

This branch line transported natural gas to the Trzebinia Reduction and Measuring Station. It was 2 km long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under 10 atmospheres, and had butt-welded butt joints. It was laid in 1948 by ZGOT and was in good condition.

The Trzebinia Reduction and Measuring Station received from ZGOT about 1000 cu m of natural gas per hour, which was sent to TRZEBINIA, where it was used in homes and industries. The largest consumer of the gas was the Trzebinia Petroleum Refinery, which received about 400 cu m of natural gas per hour.

(h) Branch Line to Item 34 (See Annex C, Item 34)

This branch line transported natural gas to the Chrzanow Locomotive Factory (Fabryka Lokomotyw Chrzanow). It was 2.5 km long, 100 mm in diameter, 3.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1950 by Gazobudowa and was in good condition.

The Chrzanow Locomotive Factory in CHRZANOW produced steam engines and diesel engines for trains. It received about 300 cu m of natural gas per hour from ZGOT.

(i) Branch Line to Item 35 (See Annex C, Item 35)

This branch line transported natural gas (about 5000 cu m per hour) to the Dwory Chemical Plant. It was very short because the trunk line ran right through the grounds of the chemical plant. The plant, a few hundred meters north-east of OSWIECIM, produced synthetic gasoline (about 20,000 tons per year) by the Fisher-Tropsch method. This method was very uneconomical because 2 cu m of natural gas were needed to produce 1 liter of synthetic gasoline, and all the gas was consumed in the process. The plant also produced methanol

plant was heavily guarded, and its labor force was about 10,000 persons.

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(9) Trunk Line from Item B to Item 38 (See Annex C, Items B and 38)

This trunk line ran from the Debowiec natural gas occurrence to the Myslowice Measuring Station.⁵ The line also received additional gas from another trunk line coming from the west. The junction of these two lines was at ZARUDZIE. The part of the trunk line from the Debowiec natural gas occurrence to the junction with the trunk line coming from the west was 53 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 12 atmospheres, had butt-welded butt joints and was laid in 1947 by ZGOT.

The next 8 km of the trunk line, from the junction of the two trunk lines to the Jawiszowice Natural Gas Distribution Junction (Item 36), was 250 mm in diameter, 6.5 mm thick, had butt-welded butt joints, was designed to operate under 25 atmospheres of working pressure, actually operated under 12 atmospheres, and was laid in 1947 by ZGOT.

The rest of the trunk line, from the Jawiszowice Natural Gas Distribution Junction to the Myslowice Measuring Station, was 29 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 6 atmospheres, had butt-welded butt joints, and was laid in 1948 by ZGOT. All of this trunk line was in good condition.

(a) Branch Line to Item 37 (See Annex C, Item 37)

This branch line transported natural gas to the Bielsko City Gasworks. It was 2 km long, 100 mm in diameter, 3.5 mm thick, was designed to operate under 25 atmospheres of working pressure, actually operated under about 12 atmospheres, and had butt-welded butt joints. It was laid in 1949 by ZGOT and was in good condition.

The Bielsko City Gasworks was subordinate to the City National Council. It received about 600 cu m of natural gas per hour from ZGOT. The gas was mixed with coal gas produced at the gasworks (amount unknown), and was transported by pipeline to the city of BIELSKO, where it was used in homes and small industries.

(b) Jawiszowice Natural Gas Distribution Junction (See Annex C, Item 36)

This distribution junction distributed gas in two directions, to the north and to the east. It sent gas to the east because there was not enough gas coming from the Warzyce Distribution Station to supply the needs of all consumers along the trunk line from Item 20 to Item 36.

(c) Myslowice Measuring Station (See Annex C, Item 38)

This station merely measured the amount of natural gas going to the Zabrze District Gasworks (about 3000 cu m per hour) so that ZGOT would know exactly how much gas it received, and for how much to bill it.

(10) Trunk Line from Item 39 to Junction at ZARUDZIE (See Annex C, Item 39 and junction at ZARUDZIE)

This trunk line was from the Marklowice Compressor Station to the previously mentioned trunk line (from Item B to Item 38) coming from the Debowiec natural gas occurrence. It was 45 km long, 300 mm in diameter, 7.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under 12 atmospheres, and had butt-welded butt joints. It was laid in 1952 by Gazobudowa and was in good condition.

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In addition to two small pipelines that transported natural gas from both parts of the Marklowice natural gas occurrence to the Marklowice Compressor Station, there were three branch lines from this trunk line.

(a) Branch Line to Item 40 (See Annex C, Item 40)⁶

This branch line ran from the Marklowice Compressor Station to the Radlin Compressor and Purifying Station, which was subordinate to the Zabrze District Gasworks. The line remained under pressure but was not to be used unless there was an emergency in which the Radlin Compressor and Purifying Station had immediate need for additional gas. It was 6 km long, 200 mm in diameter, 6 mm thick, was designed to operate under 6 atmospheres of working pressure, and had butt-welded butt joints. It was laid in 1951 by Gazobudowa and was in good condition.

(b) Branch Line to Item 41 (See Annex C, Item 41)

This branch line transported natural gas to the Zory Railroad Signal Factory (Fabryka Sygnalow Kolejowych w Zorach). It was 150 m long, 150 mm in diameter, 4.5 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1957 by Gazobudowa and was in good condition.

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the Zory Railroad Signal Factory was in ZORY, and it produced all types of railroad signals, and that it received about 250 cu m of natural gas per hour from ZGOT.

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(c) Branch Line to Item 42 (See Annex C, Item 42)

This branch line transported natural gas to the Pszczyna City Gasworks. It was 800 m long, 80 mm in diameter, 3 mm thick, was designed to operate under 12 atmospheres of working pressure, actually operated under about 10 atmospheres, and had butt-welded butt joints. It was laid in 1957 by ZGOT and was in good condition.

The Pszczyna City Gasworks was subordinate to the City National Council. It received about 300 cu m of natural gas per hour from ZGOT, and distributed it to PSZCZYNA, where it was used in homes and small industries.

e. Trunk Lines Under Construction in the Tarnow District

In March 1959 there were three trunk lines under construction in the Tarnow District, all scheduled to be finished in 1959. all but one would be finished according to schedule.

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(1) Trunk Line Under Construction from Item G to Junction with Trunk Line Between Items 2 and 3 (See Annex C)

This trunk line was to join the trunk line between Items 2 and 3 near Item 3. It was to be 35 km long, 400 mm in diameter, 9.5 mm thick, was to operate under 40 atmospheres of working pressure, and was to have butt-welded butt joints. It was being laid by Gazobudowa and was to be finished in 1959. this trunk line was completed according to schedule.

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(2) Trunk Line Under Construction from Its Junction with Trunk Line near Item 3 to Junction near Item 5 (See Annex C, Items 2 and 5)

This trunk line was to be 59 km long, 400 mm in diameter, 9.5 mm thick, was designed to operate under 40 atmospheres of working pressure, was being laid by Gazobudowa, and was to have butt-welded butt joints. It was supposed to

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22be finished in 1959, but [redacted] it was finished [redacted]
about February 1960.

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(3) Trunk Line Under Construction from Item C to Item 25 (See Annex C, Items C and 25)

This trunk line was to transport natural gas from the Dabrowa Tarnowska natural gas occurrence to the Tarnow Chemical Factory. It was to be 14.5 km long, 250 mm in diameter, 6.5 mm thick, was designed to operate under 40 atmospheres of working pressure, was being laid by Gasobudowa, and was to have butt-welded butt joints. It was supposed to be finished in 1959, and [redacted] it was finished according to schedule. It was to transport all the gas received from the Dabrowa Tarnowska natural gas occurrence to the Tarnow Chemical Factory (6000 cu m of natural gas per hour).

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f. Field Maintenance Branches and Sections (See Annex D)

The maintenance, repair, and conservation of all high-pressure, natural gas pipelines in the Tarnow District was taken care of by field maintenance branches and sections.

(1) Tarnow Field Maintenance Branch (Oddzial Tarnow)

The Tarnow Field Maintenance Branch was in TARNOW, and had a labor force of about 60 people. It was responsible for the operation, repair, maintenance, and conservation of all pipelines from PILZNO to the pipeline junction near Item 31 and from the pipeline junction near MIELEC to Item 25. It was also to be responsible for the trunk line under construction from Item C to Item 25 (See Annexes C and C-1).

(2) Krakow Field Maintenance Branch (Oddzial Krakow)

The Krakow Field Maintenance Branch was on ulica Debnica in Krakow, and employed about 40 people. It had direct responsibility for the operation, repair, maintenance, and conservation of all pipelines from Item 30 to Item 35, and supervisory responsibility for all pipelines west of Item 35. (see Annex C).

(a) Oswiecim Field Maintenance Section (Sekcja Oswiecim)

The Oswiecim Field Maintenance Section was in OSWIECIM and was subordinate to the Krakow Field Maintenance Branch. There were about 25 people employed in this section. It was responsible for the operation, repair, maintenance, and conservation of all pipelines west of Item 35 (see Annex C).

(3) Jaslo Field Maintenance Branch (Oddzial Jaslo)

The Jaslo Field Maintenance Branch was in JASLO, and employed about 120 workers. It had direct responsibility for the repair, operation, maintenance and conservation of all pipelines from PILZNO to Item 21 (Annex C), from PILZNO to the pipeline junction near MIELEC (Annex C-1), and that portion of the northern trunk line, including all the branch lines from it, between KOSINA (Annex C) and TURZA (Annex C-1). It was also to be responsible for part of the trunk line under construction from the Lubaczow natural gas occurrence (from SIETESZ to where it was to join the northern trunk line near Item 5). In addition, it had supervisory responsibility for the branch line between Items 23 and 20 (See Annex C).

(a) Roztoki Field Maintenance Section (Sekcja Roztoki)

The Roztoki Field Maintenance Section was subordinate to the Jaslo Field Maintenance Branch, and employed about 20 workers. It was responsible

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for the repair, operation, maintenance, and conservation of the branch line between Items 23 and 20 and for the operation of the Roztoki Natural Underground Reservoir (see Annex C).

(4) Krosno Field Maintenance Branch (Oddzial Krosno)

The Krosno Field Maintenance Branch was in KROSNO, and employed about 50 workers. It had direct responsibility for the repair, operation, maintenance, and conservation of all pipelines from Item D to Item 20 and Item D to Item 21. This included the trunk line from Item F. It also had supervisory responsibility for the branch line from Item D to Item 18 (see Annex C).

(a) Sanok Field Maintenance Section (Sekja Sanok)

The Sanok Field Maintenance Section was in SANOK, and employed about 12 workers. It was responsible for the repair, operation, maintenance, and conservation of the branch line from Item D to Item 18. This section was subordinate to the Krosno Field Maintenance Branch (see Annex C).

(5) Sandomierz Field Maintenance Branch (Oddzial Sandomierz)

The Sandomierz Field Maintenance Branch was in SANDOMIERZ, and it employed about 60 workers. It had direct responsibility for the operation, maintenance, repair, and conservation of all pipelines from the pipeline junction near MIELEC to Item 7 (Annex C-1) and the trunk line to the north from Item 7 to Item 13 (Annex C-2). It also had supervisory responsibility for all pipelines between TURZA and Item 7, and for the compressor station in ZURAWICA (Item 2, Annex C).

(a) The Stalowa Wola Field Maintenance Section (Sekcja Stalowa Wola)

The Stalowa Wola Field Maintenance Section was in STALOWA WOLA, and it was subordinate to the Sandomierz Field Maintenance Branch. This section employed about 12 workers, and was responsible for the operation, repair, maintenance and conservation of the pipelines from TURZA to Item 7 (see Annex C-1).

(b) Przemysl Field Maintenance Section and Compressor Station

This section was also subordinate to the Sandomierz Field Maintenance Branch, and was in PRZEMYSŁ. About 20 workers were employed, and it was responsible for the repair, maintenance, operation, and conservation of all pipelines east of KOSINA and SIETESZ. It was also to be responsible for the Przemysl Compressor Station when it was finished.

g. Gas Filling Stations

Not including the gas filling stations in the Zabrze District, already covered in a previous report,⁶ there were 10 gas filling stations that received natural gas from ZGOT. Five of these gas filling stations was subordinate to ZGOT, one was part of the Lenin Steel Works, and four were subordinate to the Warsaw Area Gasworks.

(1) Gas Filling Stations Subordinate to ZGOT

The five gas filling stations subordinate to ZGOT were in KRAKOW, BRONOWICE, TARNOW, KROSNO, and RZESZOW. Each of these gas filling stations was capable of receiving 500 cu m of natural gas per hour, but the amount they actually received varied greatly depending on how many vehicles received gas from the stations.

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(2) Gas Filling Station at the Lenin Steel Works

This station was a part of the Lenin Steel Works. It was capable of receiving 360 cu m of natural gas per hour, which was used for the vehicles of the Lenin Steel Works.

(3) Gas Filling Stations Subordinate to the Warsaw City Gasworks

There were four gas filling stations subordinate to the Warsaw Area Gasworks. Each of these stations was capable of receiving 150 cu m of natural gas per hour, and they were all in or around WARSAW.

h. Use of Natural Gas Pipelines to Transport Liquid Fuel⁷

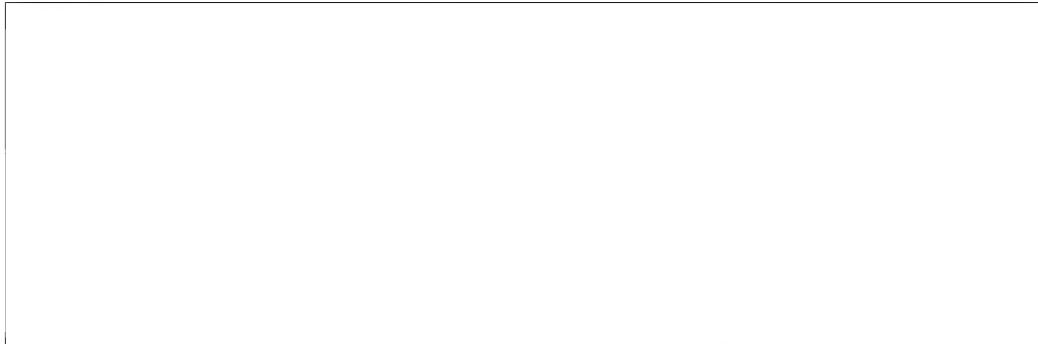
If natural gas pipelines were used to transport liquid fuel, the biggest problem would be to keep the natural gas out of the pumping units. Even if the gas discharge valves were opened to allow the natural gas to escape, a small amount of gas would remain in the pipelines and would ruin the pumping units if allowed to be drawn into them. There were two ways of preventing this: the first way would be to place an insert in the pipeline, the length of which would be 2/3 the internal diameter of the pipeline, through which the liquid fuel would flow. In this way any natural gas (which would form near the top of the pipeline) would be kept out of the pumping unit by the insert. The other method would be to place the pumping units at the lowest points along the pipelines, where the pipelines would be full of liquid fuel because of the effect of gravity, and there would be no layer of natural gas to contend with.

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consideration should be given to the idea of using natural gas pipelines, in case of emergency, to store liquid fuel. 1 m of pipeline with an internal diameter of 500 mm would hold 200 liters of liquid fuel (estimating that 1 liter of fuel weighed 1 kg), which would provide a means of storing thousands of liters of fuel underground in case of emergency.

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Comments:



4. a large new petrochemical plant was to be built in PLOCK between 1961 and 1964, Also a large new oil refinery was to be built in PLOCK its annual output was to be between 1 and 2 million tons of oil, and that oil was to be transported from the USSR to the refinery by a trunk line (under construction) from the Kuybyshev oil fields.

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26Annex A
SKETCH OF THE FLOOR PLAN OF THE MAIN OFFICE OF
THE TARNOW DISTRICT GASWORKS IN POLAND

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Figure 1, First Floor

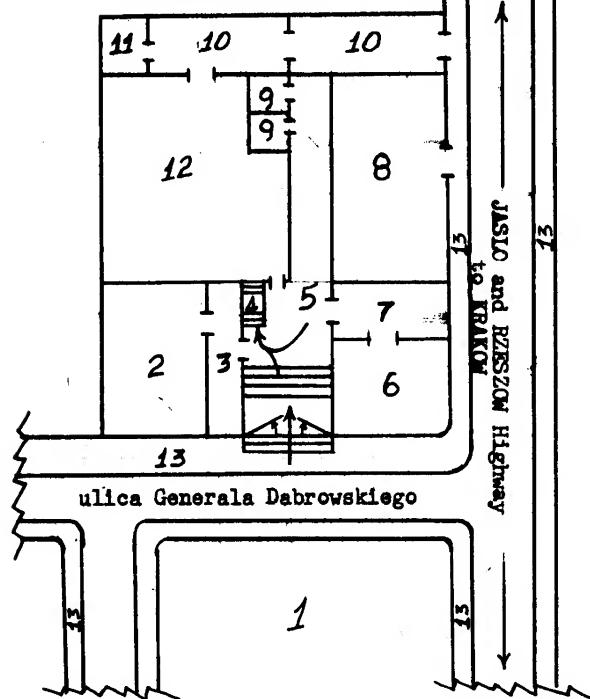
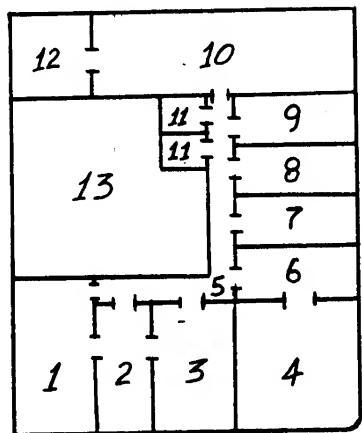


Figure 2, Second Floor



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Legend to Annex A

Figure 1, First Floor

- | | |
|--------------------------|--|
| 1. Grass plot | 8. Food store (not part of the Tarnow District Gasworks) |
| 2. Cashier's office | 9. Toilets |
| 3. Waiting room | 10. Dining Room |
| 4. Stairs | 11. Kitchen |
| 5. Corridor | 12. Courtyard |
| 6. Telephone exchange | 13. Sidewalks |
| 7. Receptionist's office | |

Figure 2, Second Floor

- | | |
|---|------------------------------|
| 1. Second deputy director's office | 8. Production Branch |
| 2. Secretariat | 9. First deputy director |
| 3. Director | 10. Investment Branch |
| 4. Chief bookkeeper's office | 11. Toilets |
| 5. Corridor | 12. General-Technical Branch |
| 6. Finance office part of the main bookkeeping branch | 13. Courtyard |
| 7. Administrative Branch | |

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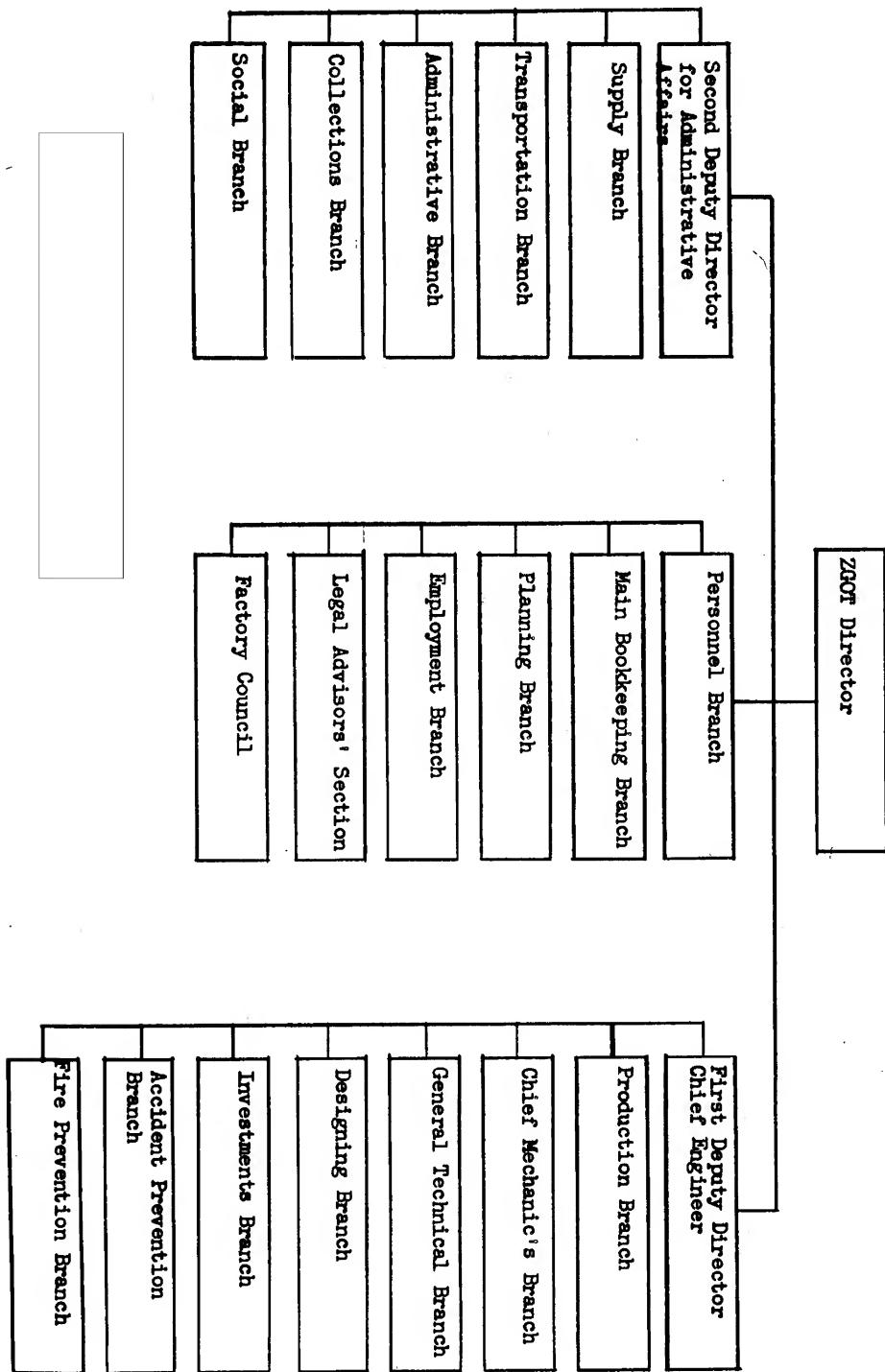
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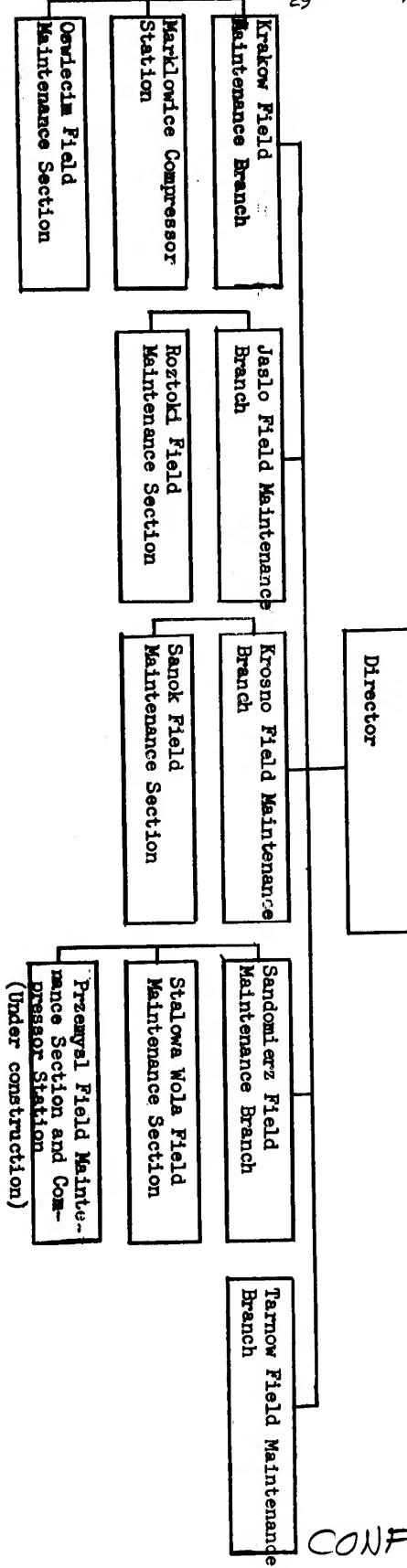
ORGANIZATIONAL CHART OF THE MAIN OFFICE OF THE TARNOW DISTRICT GASWORKS
IN POLAND

Annex B



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ORGANIZATIONAL CHART OF SUBORDINATE AGENCIES OF THE TARNOW DISTRICT
GASWORKS IN POLAND

Annex D

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Legend to Annex C

- | | |
|--|---|
| A. Marklowice Natural Gas Occurrence | 34. Chrzanow Locomotive Factory |
| B. Debowiec Natural Gas Occurrence | 35. Dwory Chemical Factory |
| C. Dabrowa-Tarnowska Natural Gas Occurrence | 36. Jawiszowice Natural Gas Distribution Junction |
| D. Zablotce Natural Gas Occurrence | 37. Bielsko City Gasworks |
| E. Strachocina Natural Gas Occurrence | 38. Myslowice Measuring Station |
| F. Rudawka-Rymanowska Natural Gas Occurrence | 39. Marklowice Compressor Station |
| G. Lubaczow Natural Gas Occurrence | 40. Radlin Compressor and Purifying Station. |
| H. Krosno Oil Field | 41. Zory Railroad Signal Factory |
| 1. Przemysl Measuring Station | 42. Pszczyna City Gasworks |
| 2. Przemysl Compressor Station | |
| 3. Jaroslaw Reduction and Measuring Station | |
| 4. Przeworsk Reduction and Measuring Station | |
| 5. Rzeszow Reduction and Measuring Station | |
| 18. Sanok Reduction and Measuring Station | |
| 19. Krosno Reduction and Measuring Station | |
| 20. Warzyce Distributing Station | |
| 21. Glinik Gasoline Plant | |
| 22. Jaslo Reduction and Measuring Station | |
| 23. Roztoki Natural Underground Reservoir | |
| 24. Debica Tire Factory | |
| 25. Tarnow Chemical Factory | |
| 28. Tarnow Reduction and Measuring Station | |
| 29. Bochnia Reduction and Measuring Station | |
| 30. Lenin Steel Works | |
| 31. Krakow Area Gasworks | 50X1-HUM |
| 32. Krakow Bronowice Reduction and Measuring Station | |
| 33. Trzebinia Reduction and Measuring Station | |

Symbols:

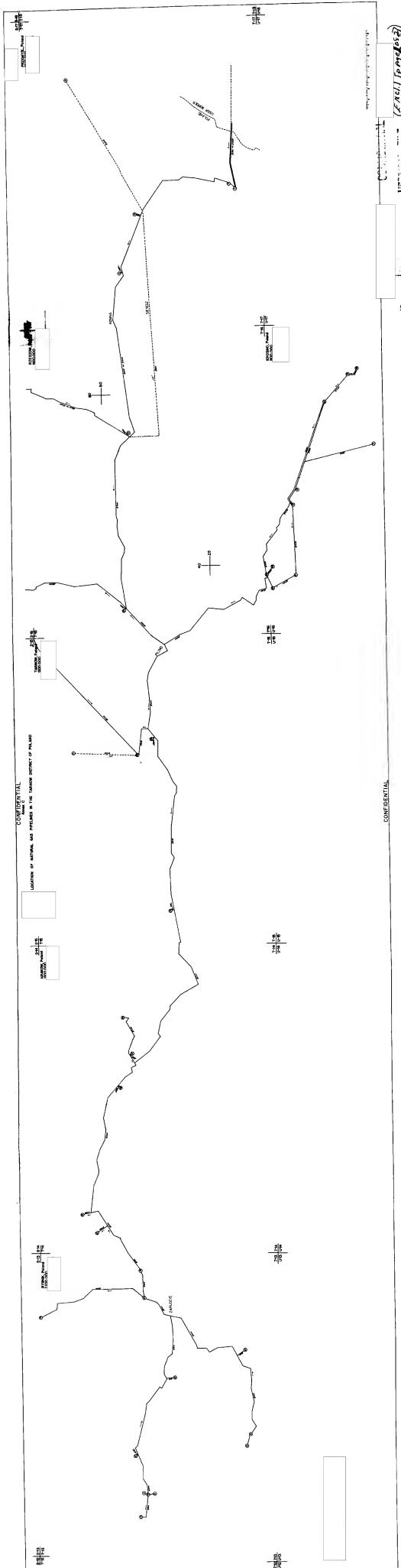
→ Direction of gas flow

∅ Internal diameter of pipeline in millimeters

UC Under construction

— International pipeline connection.

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Legend to Annex C-1

- 6. Stalowa Wola Steel Works
- 7. Sandomierz Reduction, Measuring and Distributing Station
- 8. Ostrowiec Steel Works
- 26. Mielec Airplane Factories
- 27. Tarnobrzeg Sulfur Mine

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Symbols:

ϕ Internal diameter of pipelines
in millimeters

→ Direction of gas flow

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Annex C-1

LOCATION OF NATURAL GAS PIPELINES IN THE TARNOW DISTRICT OF POLAND

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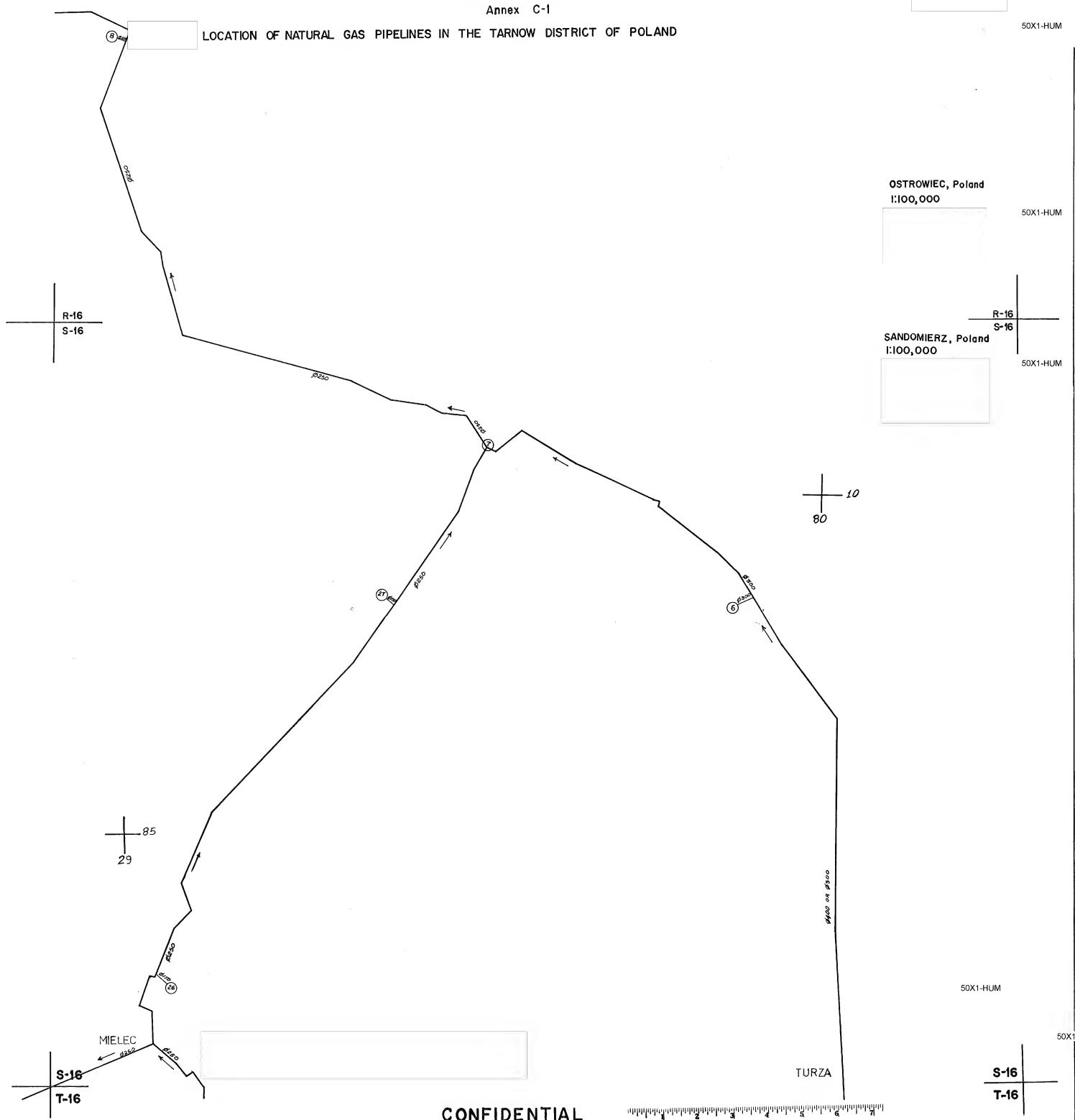
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OSTROWIEC, Poland
1:100,000

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SANDOMIERZ, Poland
1:100,000

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³⁴

Legend to Annex C-2

9. Kielce Steam Boiler Parts Factory
10. Lubienia Measuring Station
11. Starachowice Truck Factory
12. Radom City Gasworks
13. Warsaw Area Gasworks
14. Ursus Tractor Factory
15. Mory Reduction and Measuring Station
16. Warsaw Steel Works
17. Ozarow Glass and Picture Tube Factory

Symbols:

- ∅ Internal diameter of pipelines
in millimeters
- Direction of gas flow
- "P" Planned pipeline

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(Enc. 3 Page 2 of 2)
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Annex C-2

LOCATION OF NATURAL GAS PIPELINES IN THE TARNOW DISTRICT OF POLAND

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WOLOMIN, Poland
1:100,000

N-15
P-15

WARSZAWA, Poland
1:100,000

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50X1-HUM

50X1-HUM

RADOM, Poland
1:100,000

P-15
Q-45

50X1-HUM

Pilica River

10
18

70
90

KIELCE, Poland
1:100,000

Q-15
R-45

Starosiedlce
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VERTICAL FILE